

NIST Circular Economy in the High-Tech World
January 27 – 28, 2021
Detailed Workshop Agenda

DAY 1: WEDNESDAY, JANUARY 27

10:00 – 10:15 am ET Welcome, Martin Green, NIST

Overview of NIST mission and role in the context of the circular economy. Dr. Green will introduce the workshop, including objectives, goals, and outcomes.

10:15 – 11:15 am ET Plenary Speech: William McDonough

William McDonough is a globally recognized leader in sustainable design and development. He counsels corporate and government leaders through McDonough Innovation, is an architect with William McDonough + Partners, and created the Cradle to Cradle Certified™ Products Program through MBDC. He has written and lectured extensively on design as the first signal of human intention, including co-authoring *Cradle to Cradle: Remaking the Way We Make Things* (2002).

Mr. McDonough's plenary address is titled: TBA

11:15 – 11:30 am ET Break

11:30 am – 1:00 pm ET Session 1: How do we Create a Circular Economy?

How can we increase the circularity of critical raw materials? What are existing frameworks and metrics for a circular economy? How do mineral commodities flow throughout their lifecycle, from mining and processing to use and end-of-life planning? These questions and more will be discussed by subject experts in our first workshop session.

Speakers:

- **Jarkko Havas**, Ellen MacArthur Foundation
- **Alessandra Hool**, ESM Foundation and Chair of the International Roundtable on Materials Criticality
- **Nedal Nassar**, United States Geological Survey (USGS)
- **David Ginley**, National Renewable Energy Laboratory

1:00 – 1:45 pm ET Lunch + Networking, *Transition to the Virtual Discussion Room*

1:45 – 3:35 pm ET

Session 2 (concurrent session's A, B, and C)

2A: Electronics Recycling Challenges

A panel of five, including electronics recyclers, metals refiners, and an academic researcher will discuss the status and advances of recycling technologies for electronic waste as well as technical and economic challenges facing electronics recycling. Following the panel discussion, participants and panelists will break out into virtual roundtable discussions to further identify challenges to electronics recycling and discern research, data, and standardization needs to overcome barriers.

Panelists:

- **Peter Afiuny**, Urban Mining Company
- Electronics Recycler: TBD
- **George Lucas**, Gannon & Scott, Inc.
- **Julie Daugherty**, Multimetco, Inc.
- **Julie Schoenung**, University of California, Irvine

2B: Battery Recycling Challenges

A panel of five, including battery recyclers and researchers from academia, a national lab, and a nonprofit research organization will discuss the status and advances of recycling technologies for batteries as well as technical and economic challenges facing battery recycling. Following the panel discussion, participants and panelists will break out into virtual roundtable discussions to further identify challenges to battery recycling and discern research, data, and standardization needs to overcome barriers.

Panelists:

- **Jean-Christophe Lambert**, Lithion Recycling
- **Linda Gaines**, Argonne National Laboratory
- **Stephanie Shaw**, Electric Power Research Institute (EPRI)
- **Callie Babbitt**, Rochester Institute of Technology
- **Todd Coy**, KBI Recycling

2C: Solar Panel Recycling Challenges

A panel of five, including solar panel recyclers and researchers from academia, a national lab, and a nonprofit research organization will discuss the status and advances of recycling technologies for solar panels as well as technical and economic challenges facing solar panel recycling. Following the panel discussion, participants and panelists will break out into virtual roundtable discussions to further identify challenges to solar panel recycling and discern research, data, and standardization needs to overcome barriers.

Panelists:

- **Garvin Heath**, National Renewable Energy Laboratory
- **Parikh (Ricky) Sinha**, First Solar
- **Kristina Whitney**, Recycle PV Solar
- **Cara Libby**, Electric Power Research Institute (EPRI)
- **Meng Tao**, Arizona State University

3:15 – 3:30 pm ET

Break

Transition to Plenary session in the Virtual Auditorium

3:30 – 5:00 pm ET

Session 3: Boundary-Spanning Tools to Support the Circular Economy

Four experts from academia, national labs, and the US government will present boundary-spanning tools designed to track and evaluate material flows and assess techno-economic and environmental impacts of electronics, batteries, and/or solar panels throughout their life cycles.

Speakers:

- **Carol Handwerker**, Purdue University: Ostrom Framework for self-managing sustainable social-ecological systems
- **Melissa Bilec**, University of Pittsburgh: Materials flow through industry tool
- **Alberta Carpenter**, National Renewable Energy Laboratory: Lifecycle assessment and inventories
- **John Glaser**, US Environmental Protection Agency: ADEPT: A tool to evaluate electronics flows for the US

5:00 pm ET

Adjourn for the day.

Continued.

DAY 2: THURSDAY, JANUARY 28

10:00 – 10:15 am ET Introduction to Day Two

10:15 - 11:15 am ET Plenary Speech: Dr. Thomas Graedel

Dr. Graedel is Professor Emeritus of Industrial Ecology and Chemical Engineering at Yale University. His research is centered on developing and enhancing industrial ecology, the organizing framework for the study of the interactions of the modern technological society with the environment. His current interests include studies of the flows of materials within the industrial ecosystem and the development of analytical tools to assess the environmental characteristics of products, processes, the service industry, and urban infrastructures.

Dr. Graedel's plenary address is titled "Are there limits to circularity?"

11:15 – 11:30 am ET Break

11:30 am - 1:00 pm ET Session 4: Reuse, Repair, and Refurbishment in a Circular Economy

Reuse, repair, and refurbishment are equally important in a circular economy as recycling. In this session, five speakers from different sides of the reuse/repair/refurbish/remanufacture industry will discuss their role in the circular economy and specific challenges to keeping products (i.e., not just materials) in motion.

Speakers:

- **Kyle Weins**, iFixit
- REMADE Institute
- **Eric Lundgren**, Big Battery
- **Adam Shine**, Sunnking
- **Josh Lepawsky**, Memorial University

1:00 – 1:45 pm ET Lunch + Networking

1:45 - 3:15 pm ET Session 5: Best Practices for a Circular Economy

What are the roles and responsibilities of government and the private sector in a circular economy? This session will explore this question and provide

examples of business models, company practices, and tools to support circularity. Presenters will include the following:

- **Mark Buckley**, One Boat Collaborative: Business models for circularity
- **Joanne Larson**, Seagate: Closing the loop on hard disk drives
- **Kathleen Fiehrer**, Intel: Circularity at Intel
- **Corey Dehmey**, Sustainable Electronics Recycling International (SERI): The role of standards and certification programs in a circular economy
- **Adina Renee Adler**, Institute of Scrap Recycling Industries (ISRI): The role and responsibility of government and the private sector in a circular economy

3:15 – 3:30 pm ET

Break

Transition to the Virtual Discussion Room

3:30 – 4:45 pm ET

Breakout Sessions

4:45 pm ET

Transition to the Virtual Auditorium

4:45 – 5:00 pm ET

Closing Remarks